

What is claimed is:

1. An epitaxial base substrate comprising:
a base made of a single crystal material, and
a III nitride film including at least Al element and having a screw-type
dislocation density of $1\times 10^8/\text{cm}^2$ or below which is formed on said base.
2. An epitaxial base substrate as defined in claim 1, wherein said III nitride
film includes 50 atomic percentages or over of Al element for all of the III element.
3. An epitaxial base substrate as defined in claim 2, wherein said III nitride
film is made of AlN.
4. An epitaxial base substrate as defined in claim 1, wherein said III nitride
film is formed at a temperature of 1100°C or over by a MOCVD method.
5. An epitaxial base substrate as defined in claim 4, wherein said III nitride
film is formed within 1100-1250°C.
6. An epitaxial base substrate as defined in claim 1, wherein the Al content
of said III nitride film is continuously or stepwisely decreased in the thickness
direction from said base toward the outside.
7. An epitaxial base substrate as defined in claim 1, wherein the warpage of
said epitaxial base substrate is reduced up to 50 μm or below.
8. An epitaxial substrate comprising:
a base made of a single crystal material,
a III nitride buffer film including at least Al element and having a screw-type
dislocation density of $1\times 10^8/\text{cm}^2$ or below which is formed on said base, and
a III nitride underfilm which is formed on said III nitride buffer film.
9. An epitaxial substrate as defined in claim 8, wherein said III nitride
buffer film includes 50 atomic percentages or over of Al element for all of the III
element.
10. An epitaxial substrate as defined in claim 9, wherein said III nitride
buffer film is made of AlN.
11. An epitaxial substrate as defined in claim 8, wherein said III nitride
buffer film is formed at a temperature of 1100°C or over by a MOCVD method.
12. An epitaxial substrate as defined in claim 11, wherein said III nitride
buffer film is formed within 1100-1250°C.
13. An epitaxial substrate as defined in claim 8, wherein said II nitride

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underfilm includes at least Ga element.

14. An epitaxial substrate as defined in claim 13, wherein the Al content of said III nitride buffer film is continuously or stepwisely decreased in the thickness direction from said base toward said III nitride underfilm.

15. An epitaxial substrate as defined in claim 8, wherein the warpage of said epitaxial substrate is reduced up to 50 μm or below.

200010-Substrate Strength